Contribution ID: **5** Type: **Lightning Talk 10'**

Generating Feynman Diagrams for QED in Julia

Monday 30 September 2024 17:00 (30 minutes)

Calculating differential cross-sections of scattering processes is a crucial observable in high-energy physics, used to predict experimental outcomes and test theoretical models. For perturbative quantum field theories, this involves generating all possible Feynman diagrams for a given scattering process and translating them into computable functions. This becomes cumbersome very rapidly, especially for high-multiplicity processes. In this talk, we introduce a method implemented in Julia for generating these functions for arbitrary scattering processes in perturbative QED, utilizing the GraphComputing.jl library. Our approach incorporates novel results and reuse optimizations, which could be extended to other theories or even the entire Standard Model and beyond.

Primary author: REINHARD, Anton

Co-authors: EHRIG, Simeon; Dr HERNANDEZ ACOSTA, Uwe (Helmholtz-Zentrum Dresden-Rossendorf)

Presenter: REINHARD, Anton

Session Classification: Talks